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Adolescents at Risk

Psychosomatic health complaints, low life satisfaction, excessive sugar consumption and their relationship with cumulative risks

Sophie D. Walsh, Zlata Bruckauf and Tania Gaspar

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ADOLESCENTS AT RISK: PSYCHOSOMATIC HEALTH COMPLAINTS, LOW LIFE SATISFACTION, EXCESSIVE SUGAR CONSUMPTION AND THEIR RELATIONSHIP WITH CUMULATIVE RISKS

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Abstract: Adolescence is a time of transitions when experimentation, risk taking and active peer interactions can be viewed as a part of the development process. Yet, for some groups of young people with reported poor psychosomatic health, low life satisfaction or unhealthy eating habits these experiences may be different. Empirical evidence is limited in recognising the overlapping and cumulative risks of adolescents' health disadvantage and multiple externalized risk behaviours and outcomes (smoking, drinking, binge drinking, regular fighting, injuries and bullying). Drawing on the most recent 2013/2014 data of the Health Behaviour of School Children (HBSC) study, this paper examines the risks of individual and cumulative risks (three or more types) associated with being in the bottom group of psychosomatic health complaints, life satisfaction and unhealthy eating (excessive sugar consumption) across 29 countres. Using multivariate logistic modelling, the association that was the strongest, most consistent and independent of family affluence (FAS) was that between cumulative risks and high levels of psychosomatic health complaints. Similarly consistent, although weaker, is the association found between adolescents' low life satisfaction and unhealthy eating. Only in Greece and Hungary does the association between cumulative risks and life satisfaction seem to be mediated by family socio-economic status (SES). This is also the case for Denmark and Malta in the case of unhealthy eating.

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1. INTRODUCTION

Adolescence is a period of identity formation (Erikson, 1968) in which experimentation and exploration, including involvement in risk-taking activities can be part of the way that a young person negotiates and navigates a healthy developmental process. Experimentation can be seen to serve developmentally appropriate functions (Maggs, Almeida, & Galambos, 1995), such as facilitation of peer interactions, teaching youth to negotiate adult behaviours and enabling identity achievement (Dworkin, 2005). Exploration can also be a vehicle of the transition into adulthood (Pickett et al., 2002). As an opportunity for challenge and excitement (Chassin, Presson, Morgan-Lopez, & Sherman, 2007; Dworkin, 2005), it can be part of a normative developmental process.

Yet empirical evidence has also exposed risk-taking behaviours, such as cigarette and alcohol use, peer violence, bullying and activities with high chances of injury, as behaviours that can compromise adolescents' well-being and health (Valois, Kerr, & Kammerman, 2014; Walsh et al., 2013). Literature acknowledges that risk behaviours can become "problem behaviours" (Jessor & Jessor, 1977) where involvement in multiple risk behaviours becomes a threat to the young person's well-being, adaptation and growth. The 'Problem Behavior' framework considers risk behaviours in a psychosocial framework which emphasizes both the costs and benefits of risk behaviours for adolescents (Jessor, 1998; Jessor & Jessor, 1977). In this framework, risk behaviours exist in an organized constellation and are strongly correlated, leading the young person to involvement in multiple risk behaviours.

Empirical evidence for a problem behaviour perspective has suggested that covariance of risk is particularly evident with problematic risk behaviours (e.g. drug use, alcohol use, delinquency and sexual precocity) and is a characteristic of deviance-prone youngsters (Donovan, Jessor, & Costa, 1993). A problem-behaviour framework sees risk behaviours as becoming problem behaviours when a) the young person is involved in multiple risk behaviours; b) these behaviours are impacting negatively on normative developmental processes. While the literature on the impact of adolescent involvement in cumulative or multiple risks is limited, Problem-Behaviour Theory highlights the relevance of cumulative risk, over and above specific risk behaviours and factors, as important in understanding negative outcomes and adaptation of adolescents.

In the public policy domain individual and cumulative problem behaviours are increasingly seen as risk factors for personally, socially or developmentally undesirable outcomes (Harel-Fisch, Abdeen, Walsh, Radwan, & Fogel-Grinvald, 2012; Jessor, 1998). However, despite its public health importance, research on the relationship between involvement in multiple risks and psychological well-being among adolescents is very limited (Katon et al., 2010; Simpson et al., 2006). Moreover, little is known about adolescents' overlapping experiences in other important health domains. If children with poor health outcomes and low life satisfaction are also involved in more individual and cumulative problem experiences, this poses very specific challenges for policy development, specifically how best to integrate support services for children at risk and their families, with broader policies on reducing health inequalities.

Using data from the latest round (2013/2014) of Health Behaviour in School-aged Children Survey (HBSC), the analysis draws on the sample of over 180,000 adolescents aged 11, 13 and 15 to examine the effects of being in the disadvantaged group of poor psychological and physical health (high levels of psychosomatic health symptoms, poor nutrition as displayed through excessive sugar consumption), and low life satisfaction on the likelihoods of engaging in individual and cumulative risks. The contribution of this paper to academic and policy debate is not only in focusing on adolescents' cumulative or overlapping experiences and outcomes, and their prevalence among adolescents and associated risks, but also on using a novel measure of health disadvantage, grounded in the concept of bottom-end health inequality (Chzhen et al. 2016).

The current paper is structured as follows: Section two underlines the conceptual framework and scholarly approaches to the relationship between health behaviour, life satisfaction and risk behaviours and outcomes. Section three presents data, measurements and methods. Section four presents findings of descriptive and multivariate analysis. We conclude in section five with the discussion of results.

2. FRAMEWORK AND REVIEW OF EVIDENCE

2.1 Psychosomatic health, life satisfaction and risk activities

Problem-Behaviour Theory (Jessor, 1992, 1998), as outlined above, suggests that over and above examining the links between specific risk behaviours and psychological well-being, it is important to examine the relationship between psychological health and multiple or cumulative risks. Yet scholarship in this area is limited (Katon et al., 2010). Research examining involvement in multiple risk behaviours has found an inverse relationship between multiple risk behaviours and psychosomatic health symptoms (Simpson et al., 2006). In a study exploring the relationship between suicidal ideation and cumulative risk behaviours (Harel-Fisch et al., 2012), particularly high levels of suicidal ideation were found among those adolescents involved in 4 or more risk behaviours (regardless of involvement in specific risk behaviours). These findings suggest the vulnerability of young people involved in multiple risk-taking activities and the importance of examining the relationship between psychological well-being and cumulative risks, over and above the relationship with specific, individual behaviours. Depressive symptoms among adolescents have been found to be related to multiple substance use behaviours (Katon et al., 2010). Similarly, multiple risk behaviours (three or more of sexual risk behaviours, high levels of aggression and rule-breaking and substance use) have been found to be related to levels of depressive symptoms among adolescents (Okello et al., 2015; Okello, Nakimuli-Mpungu, Musisi, Broekaert & Derluyn, 2013). Physical and emotional health, as well as well-being, have been found to be inversely related to the number of health risk behaviours (Evers, Castle, Prochaska, & Prochaska, 2014), but this particular study looked at an adult population rather than adolescents

Empirical research has shown that adolescents involved in health risk behaviours, such as substance use and peer violence show both lowered psychological well-being (e.g increased depression, psychosomatic symptoms) and lower levels of life satisfaction. Involvement in

externalizing or risk-taking behaviours has been long found to be related to lowered psychological well-being among adolescents and young adults (Capaldi, 1992; Ferdinand and Vurhulst, 1996; Simpson et al., 2006). Depressive symptoms have been consistently found to be related to increased alcohol use and abuse and earlier onset of substance use (Costello et al., 1999; Marmorstein, 2009; McCarty et al., 2012) and increased cigarette smoking among adolescents (Goodman & Capitman, 2000; Windle & Windle, 2001), with a stronger relationship between depressive symptoms and substance use for adolescent girls (Poulin et al., 2005). In addition, adolescents involved in bullying, both as perpetrators and as victims have been found to exhibit lower psychological well-being and higher depressive, anxiety and psychosomatic symptoms (Due et al., 2005; Kaltialo-Heino, 2000; Klomek et al., 2007; Saluja et al., 2004), and adolescents involved in frequent physical fighting have been shown to display higher levels of depressive and psychosomatic symptoms (Brooks et al., 2002; Walsh et al., 2013).

Life satisfaction refers to the cognitive appraisal of one's subjective well-being and quality of life (Diener and Diener 1996). Sun and Shek (2013) suggest that having a positive judgment is linked to better emotional, social and behavioural health whereas a negative evaluation is associated with psychopathology and risk-taking behaviour among children and adolescents (Proctor et al. 2009). They claim that life satisfaction acts as a coping asset or strength (Lazarus & Folkman, 1984) in reducing young people's susceptibility to stress and risk (i.e. mediating the relationship between stress and risk taking). Empirical research on the relationship between life satisfaction and risk behaviours among adolescents is scarce (Clark & Kirisci, 1996; Newcomb, Bentler & Collins, 1986) and results have not always been consistent (Zullig et al., 2001). The limited empirical studies have generally found lowered life satisfaction to be related to increased adolescent involvement in risk behaviours such as increased cigarette smoking, illegal drug use, regular alcohol use and binge drinking (Desousa et al. 2008; Piko et al. 2005; Zullig, Valois et al., 2001), peer violence and delinquent behaviour (MacDonald et al., 2005, Proctor et al., 2009; Valois, Zullig et al., 2001), and sexual risk-taking behaviours (Valois, Zullig et al., 2002).

Since much of the research has been cross sectional, it is hard to discern the direction of the relationship between life satisfaction and involvement in risk behaviours. While Sun and Shek (2013) regard increased life satisfaction as a coping mechanism itself in the form of positive cognitive appraisal, young adolescents dissatisfied with life might abuse inhalants as an ill-advised coping mechanism for dealing with life dissatisfaction, or experiment with inhalants out of curiosity (Zullig et al., 2001). On the other hand, the involvement in risk behaviours may lead to social, academic and family difficulties which, in turn, can lower a young person's satisfaction with life.

While the direction of the causal relationship between well-being (both psychosomatic health and life satisfaction) and risk behaviours is debated, it is often explained through an "acting-out" or "externalising" hypothesis (Overbeek et al., 2005) whereby internal distress experienced by the adolescent is externalized into risk behaviours such as violence, substance use, delinquent behaviour and dangerous activities. In a recent study showing mental health symptoms (including depression and anxiety) among adolescents as predictors of their alcohol use, the authors suggest that substance use can be used to alleviate symptoms of depression or anxiety

(Virtanen, Nummi et al., 2015). Both an "externalizing" perspective and a "self-medication" perspective see risk behaviours as an expression of underlying negative emotions that a young person who lacks more adaptive or healthy coping resources is unable to deal with. In addition, while research has consistently found a relationship between lowered psychological well-being and individual risk behaviours, little research has examined the relationship between psychological well-being and cumulative risk behaviours.

2.2 Sugar consumption and risk behaviour

Balanced nutrition is very important during childhood, which is a period of vigorous growth, increased activity, and development of body functions and social cognitive ability. Much of the research around the relationship between diet and mental health in children and adolescents has focused on dietary intake and externalizing behaviours (particularly hyperactivity) (O'Neil, et al., 2014; Sarris, et al, 2015). In the area of sugar consumption, research has tended to focus on the impact of consumption of sugar-sweetened beverages ('non-diet soft drinks'), in particular on the relationship between soft drink consumption and weight gain and obesity (Apovian, 2004; Malik, Schulze, & Hu, 2006). Research on the relationship between sugar intake and risk behaviours is very limited and the explanatory mechanism behind the relationship is even less clear.

Among the few empirical studies carried out, research among 5,498 adolescents in Norway found that high levels of consumption of soft drinks were related to higher levels of conduct problems, hyperactivity and mental distress (Lien, Lien, Heyerdahl, Thoresen, & Bjertness, 2006). Similarly research in Boston, among 2,725 students, against the backdrop of the famous "twinkie defense" in which excessive sugar intake was used in a court of law as an explanation for homicide, found that frequent consumers of soft drinks were much more likely to have carried a gun or a knife, and to have been violent with a sibling, person they were dating, or another young person. Results suggested a dose-response relationship (Solnick & Hemenway, 2011). Similarly, higher soft drink consumption was found to be associated with being in a physical fight, feeling sad and hopeless and having suicidal thoughts and actions (Solnick & Hemenway, 2014), with lowered physical activity and current cigarette use (Park, Sherry, Foti, & Blanck, 2012) and with alcohol, cigarette and drug use (Terry-McElrath, O'Malley, & Johnston, 2014). Yet in the latter study the link between energy drink consumption and the substance use outcomes was stronger than for the regular soft drinks. Smoking, being bullied/threatened/injured on school property, and other risk behaviours were significantly associated with daily non-diet soda intake (Park, Blanck, Sherry & Foti, 2013).

Current understandings of the mechanism explaining the relationship between soft drink consumption and antisocial or risk behaviours are limited and often speculatory (Solnick & Hemenway, 2011). Scientific experimental studies and a meta-analysis have actually tended to negate a relationship between sugar intake and aggression (Benton, 2007) and children's cognitive and behavioural functioning (Wolraich et al., 1994; Wolraich, Wilson, & White, 1995) . Yet soft drinks contain a multitude of ingredients in addition to sugar, such as caffeine, additives and so forth. Indeed, a strong relationship has been found between consumption of energy drinks (notable for their high caffeine levels as well as sugar) and marijuana use, sexual risk taking, fighting, smoking, and alcohol use (Miller, 2008). In addition, it has been suggested that low blood sugar levels

(hypoglycaemia) lead to both intake of sugary drinks and to irritability and violence (Benton, 2007). In addition, soft drink consumption has been found to be related to hyperactivity (Lien et al., 2006) which may mediate the relationship between soft drink consumption and risk behaviours. Benton (2007) also suggests that additional mechanisms could include food intolerance and micro-nutrient deficiency. Neurodevelopmental changes in mesolimbic regions which are associated with adolescent risk-taking behaviour have been found following sugar intake among adolescents (Galvan & McGlennan, 2013). In addition, detrimental behaviours or being victimized might be associated with soda intake because evidence suggests that for children, sweet taste has analgesic properties and the stronger their sweet preference, the greater its analgesic effect on them. However, to date the scarce empirical studies have tended to be single country or single state studies and have focused on sugary beverages, many of which contain multiple ingredients. No studies have examined the relationship between sugar intake and multiple risk behaviours and outcomes. The current study, including 29 countries, is a unique opportunity to explore the relationship between sugar intake, in the form of not only soft drinks but also sweets and chocolates and the relationship with individual and multiple risks among adolescents.

The current study examined the relationship between disadvantaged health status (high levels of psychosomatic health symptoms, excessive sugar intake and low levels of life satisfaction) and involvement in individual (smoking, alcohol consumption, physical fighting, bullying and being bullied and injuries[1]) and cumulative risks (of the types mentioned above with the exception of being bullied) among adolescents in 29 countries across Europe. As such, it attempts to take an integrated view of adolescent well-being, by examining inter-relations between both psychological and physical health status and involvement in risk-taking behaviours. The study is significant on a number of levels. Firstly, it examines the relationships between psychological and physical health and involvement in risk activities in an unprecedented number of countries. While research has tended to support the relationship between low psychological health and involvement in substance use (Marmorstein, 2009) and peer violence (Due et al., 2005), the research examining life satisfaction and sugar intake with risk behaviours among adolescents is very limited. Yet, it is critical to understand how both psychological and physical health are related to adolescent risk behaviours. In line with previous empirical studies and theory, we hypothesized that those young people with disadvantaged health status (low levels of life satisfaction and high levels of psychosomatic symptoms and sugar intake) would report higher levels of involvement in both individual and multiple risk experiences. These relationships would be consistent across countries. By examining the relationships between different health and behaviour dimensions, we will be able to identify more accurately those young people at serious long-term health and developmental risk.

3. DATA AND MEASUREMENTS

The HBSC is a school-based survey focusing on adolescent health behaviours and their underlying determinants. It is carried out simultaneously in over 40 particpating countries in Europe and North America every four years, using an international standardized methodological protocol

[1] Analysis was carried out both including and excluding injuries in the cumulative risk measure, since despite injuries being a health outcome and not a risk behaviour, previous literature has found injuries to be part of a problem syndrome with significant correlations between injuries and various risk behaviours (e.g. Pickett, Garner, Boyce & King, 2002).

(Griebler et al., 2010). The study includes nationally representative samples of school children aged 11, 13 and 15.[2] The sampling method is based on schools as the sampling unit. All students belonging to a sampled classroom are included.

This paper uses data from the last HBSC cycle in 2013/14 with the focus on countries which are in the European Union and/or the Organisation for Economic Co-operation and Development (OECD). This comprises a total sample of 32 countries in the latest cycle. However, due to data reliability issues, some countries had to be excluded from some models. For example, Israel has more than 10% of missing values in all but one risk behaviour (drunkenness). Norway has more than 10% missing values in smoking, drinking and drunkenness; Spain – regular fighting, injuries, being a victim of bullying and bullying others; Finland – regular drinking and drunkenness; Portugal – fighting and injuries; Croatia and Switzerland – in both types of bullying behaviour. This means that these countries were not included in the final model of cumulative risk behaviour which consisted of 25 countries in total.

3.1 Dependent variables

Physical fighting

Participants were asked, "During the past 12 months how many times were you involved in a physical fight"? ('never' (1), 'once' (2), '2 times' (3), '3 times' (4), '4 times or more' (5)). Frequency of fighting is a validated construct with extensive use in American and other youth risk behaviour surveys (Waxweiler, Harel, & O'Carroll, 1993). We construct a dichotomous variable of frequent physical fighting based on established classifications in the literature as three or more fights during the past 12 months (Currie, Nic Gabhainn et al., 2008).

Bullying others and being bullied

Adolescents were asked two separate questions as to "How often have you taken part in bullying another student(s) at school in the past couple of months?" and "How often have you been bullied at school in the past couple of months?". Responses to each question could be: 'I have not bullied another pupil (/been bullied) in the past couple of months' (1), 'it has happened once or twice' (2), '2 or 3 times a month' (3), 'about once a week' (4), 'several times a week' (5). These questions were preceded by a definition of bullying (Olweus, 1996) which has been well-used and validated in empirical studies in multiple countries (Due et al., 2005; Elgar, Craig, Boyce, Morgan, & Vella-Zarb, 2009). Reports of two/three or more experiences of bullying (perpetrator or victim) a month have been considered chronic bullying (Dube et al., 2009; Harel-Fisch et al., 2011). Accordingly, the variables were dichotomized.

Substance use

The HBSC questionnaire asks two separate questions to distinguish the frequency of alcohol consumption and its extent/volume: 1) Casual drinking: "In the past month have you drunk

[2] Further details surrounding methodology of the HBSC study can be found elsewhere (Currie, Molcho, Boyce, Holstein, & Torsheim, 2008) and online at http://www.hbsc.org/about/index.html

wine/ beer/ hard liquor/ any other alcoholic drink". 2) Binge drinking /Drunkenness: "Have you ever had so much alcohol that you were really drunk?" (1 – never; 2 – once; 3 – 2-3 times; 4 – 4-10 times; 5 – more than 10 times). For each question a dichotomous variable was constructed in order to identify adolescents involved in this type of risk behaviour (0=no/never; 1=once or more). HBSC items on drunkenness have been found to have good predictive and criterion validity (Kuntsche et al., 2011).

Smoking

The following question measures the smoking frequency: "How often do you smoke tobacco at present?" (1 - every day, 2 - at least once a week but not every day, 3 - less than once a week, 4 - never). Adolescents who smoked at least once a week were considered regular smokers (Richter and Leppin, 2007, De Clercq et al., 2014). Responses were coded as 0=never, 1=once or more. All substance use measures have been validated for international use (Currie et al., 2012).

Injuries / medically treated injury

Participants were asked, "During the past 12 months, how many times were you injured and had to be treated by a doctor or a nurse?".The answers are: 0 – not the last 12 months; 1 – once; 2 – two times; 3 – three times; 4 – four times or more. Following approaches found in the literature (Walsh et al., 2013; Molcho et al., 2015), the item was dichotomised as 1=no or once, 2=two or more, with a connotation of frequent exposure to injuries.

Cumulative risks

Six variables are included in the composite measure of cumulative risks: regular smoking, taking alcohol in the last month, binge drinking, regular fighting, injuries, and bullying others. Simple count index is constructed specifying the prevalence in one or more, two or more etc. risk items. As a robustness check we constructed an index which included only five types of behaviours excluding injuries. As expected, under this index the proportion of adolescents engaged in cumulative risks (defined as three or more) is lower compared to the index which includes injuries (Appendix, Table A.3). Meanwhile, the substantive results on the relationship between psychosomatic health, life satisfaction and excessive sugar consumption and cumulative risks are qualititvely in line to those presented in this paper.

3.2 Independent predictors

Constructing the measures of bottom-end inequality in health and well-being

Consistent with the definition of 'bottom-end health inequality' (Currie et al. 2011) and its focus on the lower half of health behaviour distribution, we follow an approach used in Chzhen et.al. (2016) for identifying children who have poor health and life satisfaction outcomes relative to their peers. We estimate the mean in the lower half of the distribution (mean below the median on the corresponding scale) for psychosomatic health, 'unhealthy' eating and life satisfaction, separately by country. Children falling below this threshold are in the so-called 'bottom group', which can be considered relatively disadvantaged in terms of their health behaviour as related to an average child in the least well-off half of their population.

Psychosomatic health complaints

Adolescents' health complaints were measured using the HBSC symptom checklist (HBSC-SCL) presented as an eight-item scale since the 1993/1994 survey (Haugland & Wald., 2001). Students are asked to indicate how often in the last 6 months they had experienced the following symptoms: headache; stomach ache; backache; feeling low; irritability or bad temper; feeling nervous; difficulties in getting to sleep; and feeling dizzy. The response options were 'about every day', 'more than once a week', 'about every week', 'about every month', 'rarely or never'. Following Currie et al. (2011), the present study uses all eight symptoms, summing the responses to produce a 0-32 scale, where 32 indicates the absence of health symptoms and 0 refers to frequent occurrence of all eight. Thus the 'health symptoms' scale has a positive connotation – freedom from psychological and somatic health symptoms. For the current analysis a dummy variable was constructed with 1 denoted to children with poor psychosomatic health (bottom group).

Subjective well-being: adolescents' life satisfaction

Adolescents' psychological well-being is measured using the Cantril Ladder of life satisfaction (Cantril, 1965), which was adapted for use with adolescent samples (Levin & Currie, 2014). It is a one-item scale of 11 points, from 'worst' (=0) to 'best' (=10) life. An adaption of the scale was used to attract accurate perceptions for 11-year-olds with a visual scale that represents a ladder. The advantage of the Cantril Ladder is that it results in a continuous and theoretically equal-interval measure. The validity and reliability of the adapted scale used in an HBSC study has been confirmed by Levin & Currie (2014), who found acceptable agreement for the Cantril Ladder for 11- and 13-year-old samples and approaching acceptable in the case of the 15-year-olds sample. As the current analysis uses a constructed dummy variable with 1 denoted to children and adolescents with low life satisfaction (bottom group), the results are not sensitive to somewhat skewed distribution of the scale.

'Unhealthy' eating behaviour

The HBSC study uses a food frequency questionnaire (FFQ) to measure dietary habits among adolescents. It was tested and validated among Flemish and Italian school children (Vereecken et al., 2008). The current paper draws on two mandatory items of food consumption: sweets (candy or chocolate) and soft drinks that contain sugar, as representing unhealthy eating behaviour. Children are asked to indicate how often they consume each of these by picking one of seven responses: 'never', 'rarely/less than once a week', 'once a week', 'two to four times a week', 'five to six times a week', 'once a day, every day' and 'more than once a day, every day'.

For consistency with other health indicators used in this paper, the reported consumption of sweets and soft drinks is re-coded on a reversed scale from 0-14. The scale is reverse-coded to achieve the meaning of positive outcomes with high values. Thus, 0 denotes consuming both sweets and sugared drinks more than once a day and 14 refers to never consuming sweets or sugared drinks.[3] The analysis is conducted using a dummy variable with 1 denoted to children with excessive consumption of sweets and sugared drinks (bottom group).

[3] The sweets and sugared drinks times are re-coded as follows: "never"=7, "less than once a week"=5.5, "once a week"=3, "2-4 times/week"=1, "5-6 days a week"=0.25 and "once a day, every day" and "more than once a day, every day"=0.

3.3 Method and controls

The paper explores the relationship between individual and cumulative risks across countries using multivariate logistic regression controlling for child's age, gender and the HBSC family affluence scale (FAS). FAS is a measure of family wealth, which was developed as a proxy indicator of socio-economic position (Elgar et al. 2015b, Currie et al. 2012). Between 2001/02 and 2009/10, the FAS scale included four items (ownership of a family car, own bedroom, family holidays in the last year, family computer(s)). In 2013/14 two more items were added (numbers of bathrooms and ownership of a dishwasher). This paper uses the ridit transformed FAS score, which was designed to make the FAS scale comparable across HBSC rounds (Torsheim et al. 2004).

The importance of socio-economic drivers of adolescents' health behaviour at the individual and household levels has been well established in the literature. It has been found that lower socio-economic position tends to be associated with poorer health (Marmot et al., 2013). Socio-economic inequalities in health and well-being establish so early that they can already be observed among children and adolescents (Currie et al., 2008, 2012). Moreover, this relationship has become more pronounced over time, with socio-economic inequalities among adolescents in physical activity, body mass index and self-reported health symptoms increasing between 2002 and 2010 (Elgar et al., 2015). In order to differentiate the effects of socio-economic characteristics of children from independent effects of health disadvantage and low life satisfaction it is imperative to account for its possible influence in our model.

4. RESULTS

4.1 Prevalence of individual and cumulative risks

Examination of individual risk behaviours and outcomes strongly points towards the group of Central and East European countries as showing the highest prevalence rates in substance use and other types of risks (Table A.1, Appendix). Bulgaria, Croatia, Lithuania are countries consistently found with the highest rates on a number of indicators. Meanwhile, Baltic states (Estonia, Latvia and Lithuania) have the highest prevalence of bullying (both being bullied and bullying others) among all countries in our sample. Among west European countries, Belgium has one of the highest rates of adolescents who report consuming alcohol in the last month and fighting, Germany has one of the highest prevalences of frequent injuries, and Denmark has one of the highest rates of both regular drinking and binge drinking.

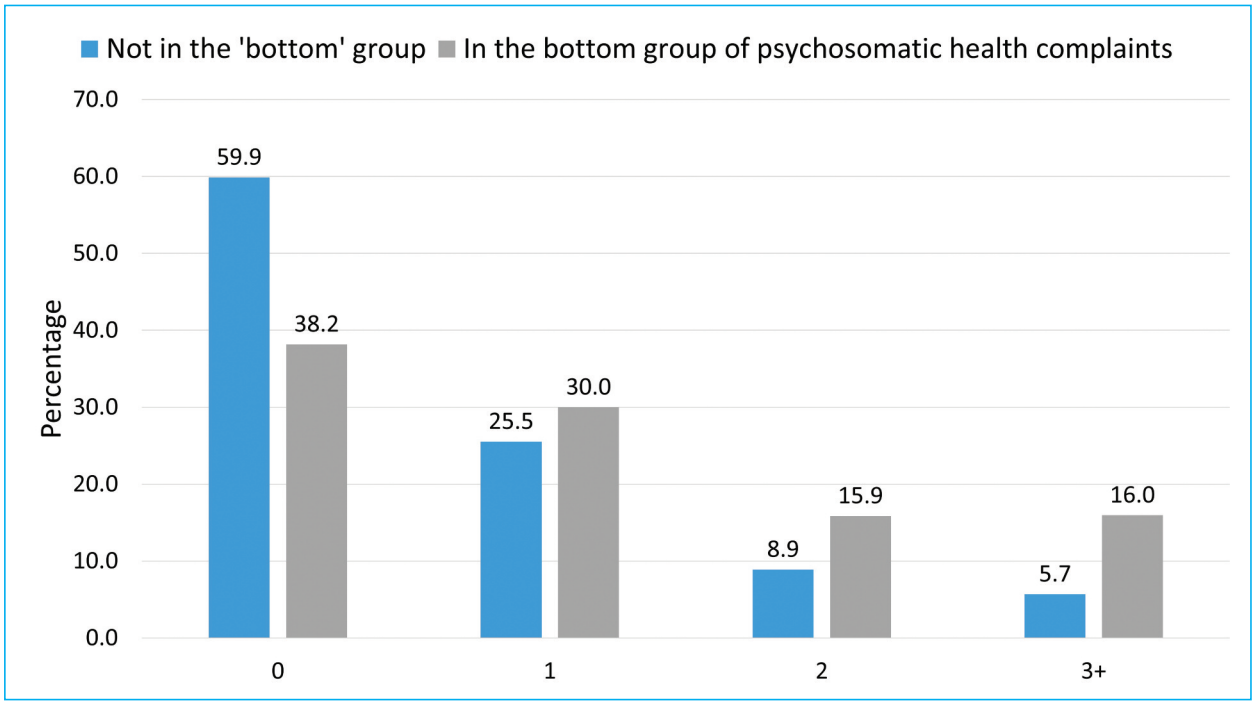
We find relatively low concentration of risk behaviours. This implies little overlap in the groups of adolescents reporting different types of problem behaviour. On average, across 26 counties with reliable data, about 1 in 6 (17.7%) of all adolescents reported engagement in two or more risk activities (smoking, binge drinking, regular drinking, fighting, frequent injuries, and bullying others) (Table A.2 Prevalance of cumulative risks (regular smoking, drinking, binge drinking, regular fighting, frequent injuries, bullying others) as a % in the total sampleTable A.1, Appendix). Only about 8% on average reported three or more problem behaviours. Yet there is a substantial

variation between countries from less than 5% in Iceland (2.1%), Ireland (4%), Portugal (4.8%)[4] and Sweden (4.2%) to more than 10% in Bulgaria (13%), Denmark (10.2%), Latvia (10.8%), Lithuania (11.6%) and Romania (11.4%). Again, it seems that more adolescents in Baltic and some Eastern European countries experience multiple risks than their peers in other countries.

4.2 Overlap of groups with relatively disadvantaged health outcomes and risk behaviours

The examination of group differences between children who are at the bottom of the health distribution relative to their peers, shows a very clear pattern of overlapping disadvantage of children in the bottom groups in psychosomatic health, life satisfaction or excessive sugar consumption. Not only do far fewer adolescents in these groups report no exposure to risk behaviours and outcomes, they are also much more likely to experience multiple risks. In the pooled sample across all countries, the differences are particularly pronounced for children with high levels of psychosomatic health complaints: 22 percentage points fewer children from the bottom group of psychosomatic health reported no engagement in risk behaviours or outcomes, about 10 percentage points more reported experiencing three or more types (Figure 1). Variations across countries are significant as the difference in exposure to multiple risks (3 types or more) can be as low as 5.5 percentage points in Iceland, and as high as 12 percentage points in Malta or Germany respectively (Table A.4, Appendix).

Figure 1 – ***Prevalence of individual and cumulative risks by health disadvantage (bottom group in psychosomatic health) in a pooled sample of countries***

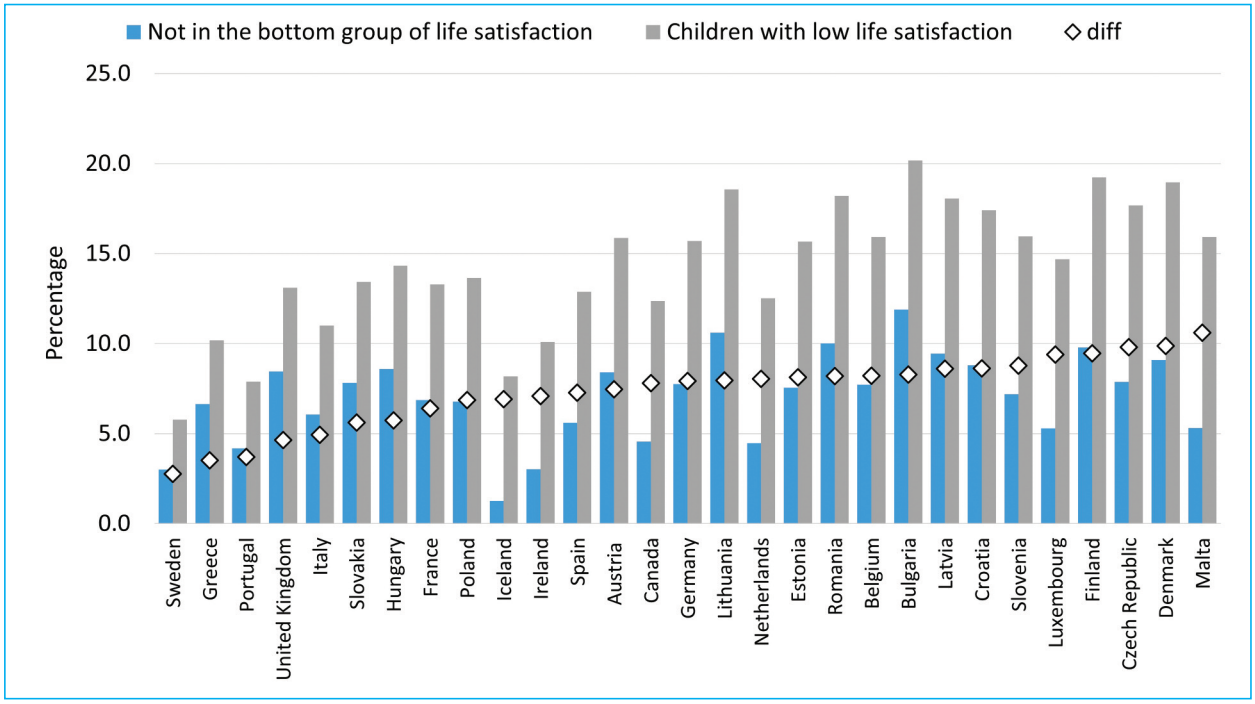


Source: HSBC 2013/2014

[4] With a border line missing values of 10% in regular fighting and injuries, Portugal was included in the analysis.

Also on average across the countries examined, 14 percentage points fewer children at the bottom of the life satisfaction scale report no engagement and about 7 percentage points more of them report cumulative risks (Figure A.5, Appendix). There are marked variations between countries with the highest differences in reporting multiple risk behaviours between children with low life satisfaction and those in the middle observed in Greece, Portugal or Sweden (around 3 - 4 percentage points) and are highest in the Czech Republic, Denmark or Malta (around 10 percentage points) (Figure 2). The group differences in excessive sugar consumption are somewhat smaller on average but show exactly the same pattern. The exception is Poland, where the group differences are negligible. On average across all countries in the sample, the difference between children with excessive sugar consumption and the rest in reporting no risks is 13 percentage points and is about 6 percentage points for multiple types of problem behaviours and outcomes (Figure A.6 Appendix).

Figure 2 – ***Proportion of children and adolescents reporting cumulative risks (3 or more types)***



Source: HBSC 2013/2014

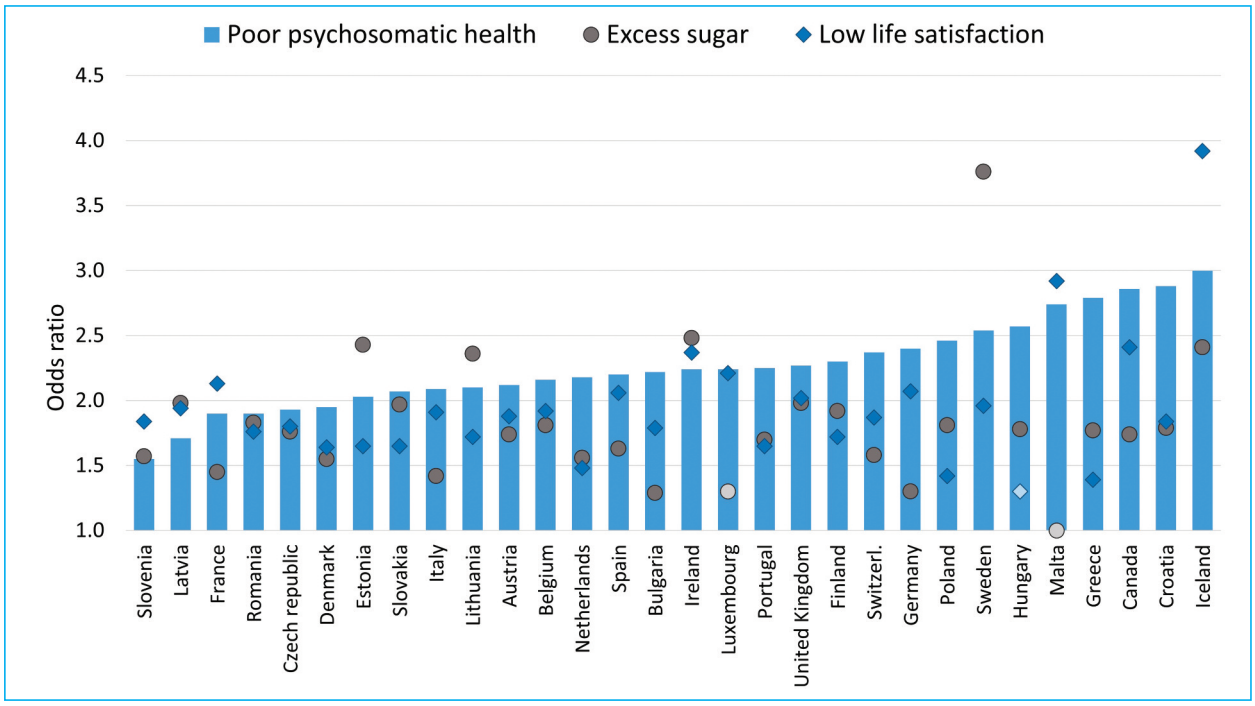
4.3 Multivariate analysis: individual risk behaviours and outcomes

Table 1 (page 21) presents the results of multivariate logistic regression on the likelihood of individual and cumulative risks. All models control for gender, age and family socio-economic affluence. The results on individual risk experiences are also discscussed.[5]

[5] All background statistics on multilevel modelling for the likelihood of individual risks are available from the authors upon request.

Smoking. Being in the bottom group of psychosomatic health, life satisfaction and unhealthy eating has a very strong and highly consistent association with adolescents' smoking experience. Children with poor health and low life satisfaction have higher odds of smoking relative to their peers in all countries with available data, even after controlling for family affluence. Being in the bottom group of unhealthy eating is associated with higher odds of smoking in 27 out of 29 countries. Exceptions are Luxemburg and Malta. Poor psychosomatic health is generally associated with slightly greater likelihood of smoking than unhealthy eating or low life satisfaction. In Norway, the odds of smoking related to poor health reaches factor 3.5; in Canada, Croatia, Greece and Iceland – almost factor 3 (Figure 3). The case of Sweden is notable due to the observed high magnitude of risks associated with being in the bottom group of sugar consumption (the odds of smoking increase by factor 3.7). Meanwhile, in Iceland, the odds of smoking for children who are less satisfied with their life are almost 4 times those who are not in the 'bottom' of the national subjective well-being distribution. But given Iceland's low prevalence rates of all types of risks behaviours, this could be due to self-selection bias.

Figure 3 – ***Likelihood of smoking associated with being in the bottom group in psychosomatic health, sugar consumption and life satisfaction***



Source: HBSC 2013/2014. Note: All values for poor psychosomatic health are statistically significant. Statistically significant values for excessive sugar consumption and life-satisfaction are indicated with a darker colour symbol. All models control for age, gender and family affluence scale.

Drinking alcohol in the past month. Children who report low levels of psychosomatic health are about twice as likely to consume alcoholic beverages in the past month than their peers in all countries with available data. The size of the effects relative to the reference group is strongest in Bulgaria, Croatia, Denmark, Greece, Iceland, Lithuania and Poland (just above factor 2), but there is not a large variation between countries (Table A.5., Appendix). Being in the disadvantaged group in

excessive sugar intake is also found to be associated with alcohol use in all countries but Malta. The magnitude of this effect is somewhat smaller than for poor health, but in some countries is on a par with poor health or even higher (Czech Republic, Greece, Latvia, Portugal, Romania, Slovakia and Sweden). Having low life satisfaction, on the other hand, is a less consistent factor across the countries showing statistically significant association in only 19 out of 30 countries.[6] The highest likelihood of drinking for children with low life satisfaction compared to their peers is observed in Austria, Belgium, Germany, Ireland (odds ratio of 1.5), Iceland (odds ratio of 2.5), and Malta (odds ratio of 1.8).

Being drunk in the last month. We find a relatively uniform effect of poor psychosomatic health on the likelihood of binge drinking among adolescents in the last 30 days. It is significant in all 29 countries with odds ranging from factor 1.6 in Austria, 1.8 in Luxemburg to factor 3.2 in Iceland, 2.9 in Greece and Ireland (Table A.5, Appendix). Being in the bottom group of unhealthy eating is associated with the likelihood of alcohol intake in 25 out of 29 countries. Being in the bottom group for life satisfaction increases the odds of drinking in 20 out of 29 countries. The magnitude of effect of both unhealthy eating and psychosomatic health is generally smaller than the effects of poor health. The observed associations were rather stable to the inclusion of the variables from the family affluence scale (FAS) in the model.

Regular fighting. Consistent with previous analysis, we find that reporting high levels of psychosomatic health complaints is associated with adolescent regular fighting behaviour across all countries.[7] The odds for adolescents with poor health in Austria, Belgium, Canada, Finland, Germany, Iceland and Norway to get into regular fights are about three times that of their peers (Table A.6, Appendix). The link between excessive sugar consumption and regular fighting is observed in 25 out of 29 countries with adolescents in Estonia, France, Lithuania, Romania and Sweden having the highest odds of engaging in this type of risk behaviour if they report excessive consumption of sugar (odds ratio of 2 or higher). Low life satisfaction is also found to have a significant association with adolescents' fighting in 26 countries with magnitude of effect comparable to excessive consumption of sugar. Notably, the odds of regular fighting associated with low life satisfaction are the highest in Denmark (odds ratio of 2.2) and Finland (odds ratio of 2.6).

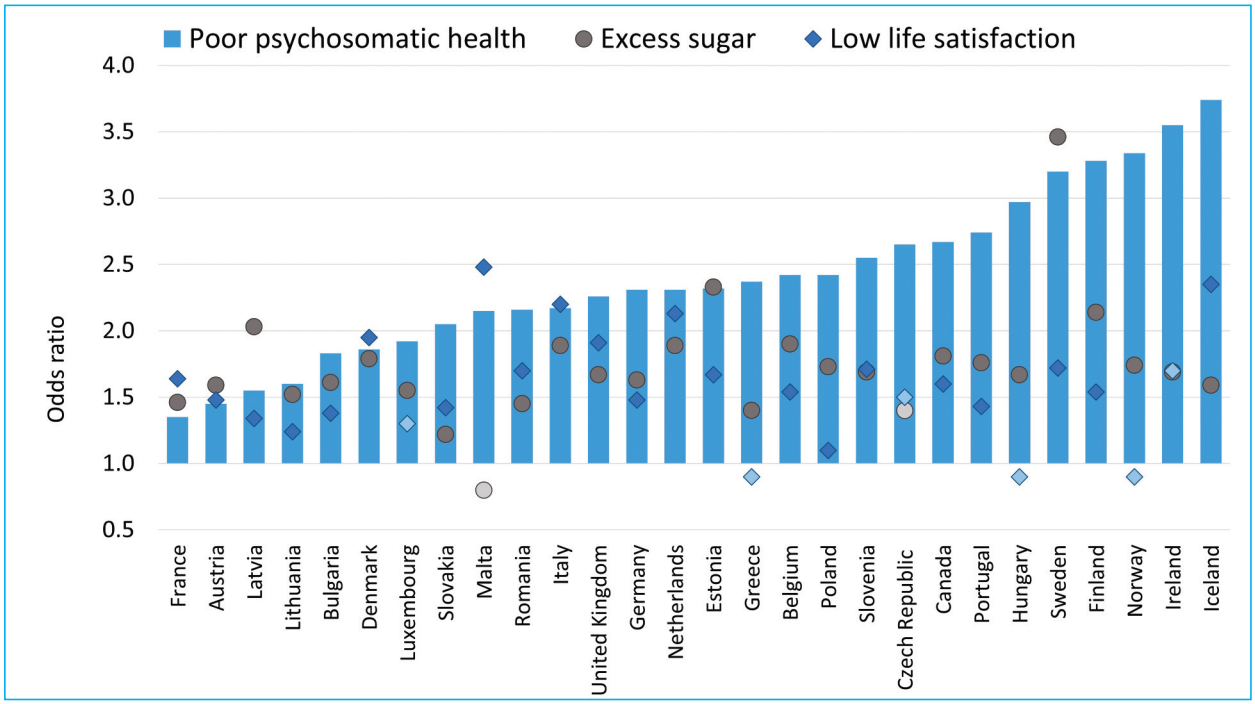
Injuries in the last year. While we confirm the strong influence of adolescents' poor health on the risks of treated injuries across all countries with available data, the findings on the links between this risk behaviour and excessive sugar consumption and low life satisfaction is mixed. Being in the bottom group of unhealthy eating is found to have significant association with the risks of frequent injuries in Austria, Belgium, Croatia, Estonia, Finland, Hungary, Ireland, Italy, Latvia, Lithuania, Romania, Slovenia, Sweden, Switzerland and the United Kingdom (Table A.6., Appendix). Similarly, a statistically significant relationship between frequent injuries and life satisfaction is found in fifteen countries (Belgium, Croatia, Denmark, Finland, France, Germany, Hungary, Iceland, Ireland, Lithuania, Luxemburg, the Netherlands, Romania, Sweden and Switzerland). In the majority of these countries the effect is statistically significant only at the 5% level.

[6] Finland, Israel and Norway were excluded due to missing data.
[7] Spain and Portugal are excluded due to missing values.

The size of the effect for these two predictors is also noticeably smaller than that observed for other types of risk behaviours. The highest odds here are observed in the Netherlands and Romania (odds ratio of 1.6).

Being a victim of bullying and bullying others. In contrast to the observed associations of unhealthy eating with the risk behaviours discussed above, being in this group has a statistically significant effect on the likelihood of being bullied in only four countries (Belgium, Hungary, Luxemburg and Portugal). Meanwhile we find consistent association of this variable with the likelihood of bullying others in 26 out of 28 countries with reliable data (Figure 4). In some countries, the odds of bullying others associated with excessive sugar consumption are similar to those of poor health (Estonia, France, Latvia). In Sweden, for children from this group the odds of bullying others are three and a half times that of their peers, which is the highest odds ratio across the countries.

Figure 4 – ***Likelihood of bullying others associated with being in the bottom group of psychosomatic health, sugar consumption and life satisfaction***



Source: HBSC 2013/2014. Note: All values for poor psychosomatic health are statistically significant. Values different from zero for excessive sugar consumption and life-satisfaction are indicated with a darker colour symbol. All models control for age, gender and family affluence scale.

Low life satisfaction has a consistent strong association with reports of being a victim of bullying (Table A.7, Appendix). Children with low life satisfaction in Denmark and the Netherlands have odds of being bullied 3.5 times those of their peers. In Iceland, the odds ratio is almost 4, but again, low prevalence of risk behaviours in this country suggests possible self-selection bias.
In many countries the odds ratio of life satisfaction is above factor 2, which is one of the strongest effects of low life satisfaction among other types of risk behaviours. The link between bullying others and low life satisfaction is present in 22 out of 28 countries with available data, but the magnitude of odds is smaller than for being a victim of bullying.

As with all other types of risk, we find that poor psychosomatic health has significant, and generally the strongest, association among three indicators with both bullying perpetration and victimisation across all countries. However, the magnitude of the effect is the strongest for the likelihood of being bullied, with the odds ratios above 3 in 14 countries. Norway can be considered an outlier with an odds ratio of 4.7.

4.4 Multivariate analysis: cumulative risks

Table 1 (page 21) presents the results of the multivariate model on the effects of being in the bottom group on cumulative risks of psychosomatic health symptoms, life satisfaction and excessive sugar consumption.

The results overwhelmingly demonstrate that children with low psychosomatic health as well as children with low life-satisfaction and excessive sugar consumption are vulnerable to cumulative risks. All three indicators have a significant effect in all but a very few countries. In Greece and Hungary, the association between life satisfaction and cumulative risk lost its significance after controlling for family affluence. This was similar in Denmark for the association with sugar consumption. The odds ratio of the psychosomatic health variable was somewhat higher when the life satisfaction dummy was removed from the model (check by the elimination), indicating that these two variables have a common psychological element. However, even with the inclusion of life satisfaction, being at the bottom for psychosomatic health remained a stable and most significant predictor of experience of risk.

Table 1 – ***Likelihood of cumulative risks associated with disadvantage (being in the bottom group) in health, excessive consumption of sweets and sugary drinks and life satisfaction.***

Cumulative risk	Poor health		Excess sugar		Low life satisfaction		Girls		Age 13 (ref. 11)		Age 15 (ref.11)		Ridit FAS		Constant		Observations
	Odds ratio	SE	Odds ratio	SE	Odds ratio	SE	Odds ratio	SE	Odds ratio	SE	Odds ratio	SE	Odds ratio	SE	Odds ratio	SE	
Austria	1.87***	(0.305)	1.83***	(0.282)	1.71**	(0.334)	0.42***	(0.063)	2.36**	(0.609)	7.29***	(1.789)	1.54	(0.354)	0.02***	(0.006)	3,036
Belgium	3.12***	(0.235)	1.64***	(0.141)	2.08***	(0.214)	0.48***	(0.044)	1.75**	(0.305)	5.14***	(0.861)	1.84***	(0.306)	0.02***	(0.004)	8,614
Bulgaria	3.28***	(0.401)	1.77***	(0.166)	1.49**	(0.190)	0.45***	(0.053)	2.01***	(0.382)	6.37***	(1.083)	1.99**	(0.440)	0.03***	(0.007)	4,098
Canada	3.74***	(0.522)	1.52**	(0.197)	1.80***	(0.264)	0.48***	(0.065)	2.51**	(0.865)	6.23***	(2.102)	0.60*	(0.154)	0.02***	(0.006)	11,113
Czech	2.95***	(0.377)	1.60***	(0.179)	1.80**	(0.313)	0.48***	(0.049)	1.69*	(0.338)	4.83***	(0.813)	1.33	(0.277)	0.03***	(0.005)	4,730
Denmark	2.88***	(0.495)	1.38	(0.236)	1.99***	(0.349)	0.62*	(0.125)	2.78***	(0.792)	20.12***	(5.480)	3.07***	(0.755)	0.01***	(0.002)	3,513
Estonia	2.36***	(0.372)	2.47***	(0.374)	1.62**	(0.271)	0.65**	(0.099)	4.73***	(1.409)	12.61***	(3.609)	1.51	(0.374)	0.01***	(0.003)	3,491
Finland	2.98***	(0.380)	1.97***	(0.249)	1.50*	(0.256)	0.59***	(0.083)	–	–	3.14***	(0.476)	1.62*	(0.347)	0.03***	(0.006)	3,598
France	2.05***	(0.301)	1.68***	(0.208)	1.78***	(0.247)	0.47***	(0.072)	1.96***	(0.382)	5.58***	(1.094)	2.62***	(0.601)	0.02***	(0.004)	5,036
Germany	2.81***	(0.369)	1.35*	(0.162)	1.68***	(0.232)	0.54***	(0.066)	3.95***	(1.009)	13.06***	(3.414)	1.92**	(0.386)	0.01***	(0.002)	4,911
Greece	3.97***	(0.596)	1.73***	(0.221)	1.07	(0.187)	0.37***	(0.062)	2.27***	(0.529)	5.34***	(1.173)	2.34***	(0.589)	0.02***	(0.004)	3,793
Hungary	3.17***	(0.429)	2.08***	(0.276)	1.32	(0.214)	0.54***	(0.076)	2.30***	(0.537)	8.51***	(1.837)	1.12	(0.256)	0.02***	(0.005)	3,400
Iceland	4.08***	(0.739)	2.49***	(0.365)	4.06***	(0.725)	0.49***	(0.086)	2.25**	(0.654)	8.29***	(2.373)	1.16	(0.405)	0.00***	(0.001)	9,153
Ireland	3.36***	(0.670)	2.21***	(0.414)	1.90*	(0.475)	0.41***	(0.097)	2.28	(1.118)	8.31***	(3.846)	0.84	(0.307)	0.01***	(0.004)	3,460
Italy	2.71***	(0.452)	1.55**	(0.221)	1.51*	(0.245)	0.43***	(0.069)	1.68*	(0.414)	6.36***	(1.324)	1.56	(0.382)	0.02***	(0.004)	3,785
Latvia	2.05***	(0.259)	2.37***	(0.228)	1.83***	(0.240)	0.58***	(0.064)	2.13***	(0.356)	5.32***	(0.845)	1.39	(0.292)	0.03***	(0.005)	5,049
Lithuania	2.61***	(0.260)	2.40***	(0.255)	1.62**	(0.245)	0.40***	(0.046)	2.10***	(0.345)	6.32***	(0.920)	1.17	(0.218)	0.04***	(0.006)	5,029
Luxembourg	2.85***	(0.518)	1.69**	(0.273)	2.54***	(0.455)	0.45***	(0.065)	1.63	(0.527)	5.56***	(1.561)	1.58	(0.464)	0.01***	(0.005)	2,603
Malta	3.23***	(0.821)	1.31	(0.353)	2.32**	(0.677)	0.45**	(0.114)	4.66**	(1.976)	14.28***	(5.849)	1.67	(0.602)	0.01***	(0.003)	1,985
Netherlands	2.46***	(0.404)	1.84***	(0.246)	1.76**	(0.309)	0.74*	(0.105)	3.38**	(1.495)	16.82***	(6.794)	1.28	(0.363)	0.01***	(0.002)	3,790
Poland	2.73***	(0.357)	2.11***	(0.257)	1.49**	(0.222)	0.52***	(0.074)	3.80***	(0.979)	7.24***	(1.753)	1.25	(0.254)	0.02***	(0.004)	4,042
Romania	2.62***	(0.361)	1.96***	(0.236)	1.97***	(0.265)	0.30***	(0.049)	1.77**	(0.313)	3.34***	(0.591)	3.43***	(0.725)	0.03***	(0.006)	3,356
Slovakia	2.63***	(0.330)	1.85***	(0.194)	1.42**	(0.169)	0.59***	(0.065)	2.34***	(0.430)	6.46***	(1.210)	1.29	(0.232)	0.02***	(0.004)	5,274
Slovenia	2.95***	(0.412)	2.03***	(0.262)	1.92***	(0.340)	0.47***	(0.063)	2.07**	(0.482)	7.39***	(1.458)	1.77**	(0.356)	0.02***	(0.004)	4,582
Sweden	2.71***	(0.386)	3.47***	(0.478)	2.15***	(0.291)	0.90	(0.137)	6.98***	(2.984)	25.95***	(10.695)	2.19**	(0.555)	0.00***	(0.000)	6,783
UK	2.74***	(0.273)	2.01***	(0.172)	1.61***	(0.169)	0.68***	(0.069)	3.37***	(0.540)	10.32	(1.59)	1.61**	(0.251)	.007***	(0.001)	13850

Source: HBSC 2012/2014; *** p<0.001, ** p<0.01, * p<0.05

5. CONCLUDING DISCUSSION

The current study examined the relationship between disadvantaged health status (low levels of life satisfaction, high levels of psychosomatic symptoms and sugar intake) with involvement in individual and cumulative risk behaviours and outcomes (smoking, alcohol consumption, drunkenness, fighting, bullying, being bullied and injuries) in over 29 countries around Europe. Although results show substantial cross national variation in prevalence of both health and risk behaviours, there were strong consistent patterns between the various health dimensions across the vast majority of countries.

Possibly the strongest and most consistent finding was that children in the group with the highest level of psychosomatic health complaints are more likely to experience not only any (and all) of the individual risk behaviours, but also cumulative risk, independent from family SES. This group shows the most consistent and strongest effect relative to other indicators and across countries. This finding is consistent with and strengthens previous literature showing the relationship between psychosomatic health symptoms (Due et al., 2005; Walsh et al., 2013) or depressive symptoms (Marmorstein, 2008; Simpson et al, 2006) and externalizing and risk behaviours. The HBSC measure of psychosomatic symptoms examines daily experience of symptoms such as head, back and stomach aches, and low, bad or nervous mood. Findings show that those adolescents in the group with the highest level of symptoms are consistently involved in higher rates of smoking, drinking, fighting, bullying and injuries and in higher levels of multiple risk across virtually all the examined countries with reliable data.

While the study is cross-sectional and cannot answer questions of causality, findings can support an "externalizing" or "self-medicating" hypothesis (Overbeek et al., 2005; Virtanen, Nummi et al., 2015) whereby psychological or physical distress is manifested through externalized risk behaviours. Results highlight that there is a group of particularly vulnerable adolescents experiencing challenges to their health and well-being in multiple dimensions. Findings can inform educators and other care workers by highlighting that intervention and prevention programmes aimed at addressing young peoples' involvement in risky acitivities need to be holistic both in the sense of appreciating that young people may be involved in multiple risks and that these risks are often especially present among those young people with disadvantaged psychological and physical health status.

As with psychosomatic health symptoms, children with the highest consumption of sugared drinks and sweets (in the bottom group in sweets and soft drinks) are consistently found to report a higher likelihood of smoking, drinking, drunkenness, fighting and being a bully across the vast majority of countries, even after adjusting for FAS. The magnitude of association and the types of risk behaviour vary from country to country and are found to be somewhat smaller than those of psychosomatic health. Yet the consistency of this association across our sample of countries is a significant finding. Previous empirical research and theory on the relationship between sugar intake and risk behaviours is limited and contradictory, and as such the findings are novel and important. While the study cannot claim to report causality, the effect might reflect teenage culture, in which consumption of soft drinks and sweets, as well as smoking, alcohol use and peer violence takes place while young people 'hang out' together, in a group context. Further research is needed to explore whether both sugar intake and involvement in risk behaviours may be related to

and predicted by an external factor such as lowered parental monitoring or involvement (DiClemente et al., 2001; Dishion & McMahon, 1998), or whether a biological explanation of sugar intake leading to higher levels of adrenalin or hyperactivity may be helpful. Lastly, it may be that sugar intake, akin to smoking or alcohol use, may be considered an addictive behaviour. Results may suggest benefits in lowering access to sugary foods at school, and better education around the health problems of a high sugar diet.

Lastly, children who are less satisfied with their life than their peers are more likely to experience regular fighting, being victims of bullying, and to be a regular smoker than their peers. There are substantial variations between countries in the magnitude of the difference and between indicators. The strength of the effect is weaker than that of poor health and in some cases even unhealthy eating. The literature on the relationship between life satisfaction and risk behaviours is scarce (Clark & Kirisci, 1996; Newcomb, Bentler & Collins, 1986) and results have not always been consistent (Zullig, Valois et al., 2001), yet current findings are in line with the limited empirical studies that have generally found lowered life satisfaction to be related to adolescent involvement in risk behaviours. Life satisfaction among young people is found to be significantly related to life experiences, parent–child relationships, stress, anxiety and loneliness (Edwards and Lopez 2006; Gilman and Huebner 2003; Kapikiran 2013). Low life satisfaction is thought to be associated with a range of psychological and social problems (Park 2004), as well as positive mental health (Gilman and Huebner 2006), and personality traits such as curiosity (Jovanovic and Brdaric 2012). Risk behaviours such as alcohol, nicotine and cannabis use have also been associated with lower adolescent life satisfaction, as have fighting and weapon injuries (Mason and Spoth 2012; Valois et al. 2001; Zullig et al. 2001).

As with findings on psychosomatic health symptoms, the study findings reinforce the strong and significant relationship between psychological well-being (life satisfaction and psychosomatic symptoms) and involvement in risk behaviours. They also suggest that an understanding of adolescent health must consider psychological, physical and behavioural dimensions. Substance use is a known predictor of delinquency (Barnes, Welte, & Hoffman, 2002), and in general, involvement in risky activities can have long-term consequences on young people's health, development and social, personal and professional achievement (Resnick & Burt, 1996).

Overall, findings show that health disadvantage and low life satisfaction overlap with other problems of adolescent well-being, so the vulnerability of these groups of children has a cumulative and multi-dimensional nature. Findings were strong and consistent across dimensions of health and across countries, emphasising a need for a perspective on adolescent health incorporating psychological and physical health, together with risk behaviours and an understanding that health disadvantages have behavioural risks, both in the short and long term. It was beyond the scope of this paper to examine specific pathways through which disadvantage in health and life satisfaction are linked to cumulative risk behaviours. These pathways may be multiple, such as via social, interpersonal and physical environmental factors, or physiological (in the case of sugar), or socio-economic factors. Longitudinal data is needed to explore the complexity of their relationship and its mediating forces. Yet, the fact that the results are highly stable to the inclusion of the family affluence scale in the majority of countries suggests that policy cannot equate multiple risk behaviour and poor adolescents' health outcomes to socio-economic disadvantage.

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APPENDIX

Table A.1 – *Prevalence of individual health risk behaviours*

Country	Regular smoking	Drinking in the last month	Binge drinking	Regular fighting	Frequent injuries	Being bullied	Bullying others
Austria	10.2	22.8	7.0	11.3	17.0	14.7	13.7
Belgium	9.2	27.0	7.1	12.7	26.8	15.3	7.8
Bulgaria	14.1	34.3	12.8	12.9	18.1	15.1	12.6
Canada	4.7	19.1	7.2	9.4	22.1	13.1	4.6
Croatia	12.6	25.3	10.6	10.5	19.7	m	m
Czech Republic	11.1	28.3	8.8	13.0	16.9	5.5	3.2
Denmark	8.4	27.0	12.7	11.0	25.6	6.3	3.7
Estonia	9.9	21.4	7.4	7.8	26.0	16.6	10.3
Finland	10.9	25.2	m	5.5	17.8	10.3	3.9
France	11.0	20.7	3.9	11.0	24.2	12.0	9.0
Germany	9.1	21.5	7.0	9.4	30.5	9.4	9.1
Greece	8.2	29.6	5.8	8.8	14.9	6.4	7.5
Hungary	11.8	27.5	10.5	13.2	14.2	9.5	4.7
Iceland	2.4	5.0	1.7	6.9	30.6	4.58	1.9
Ireland	4.7	11.0	4.8	8.2	18.3	7.6	2.1
Italy	12.6	23.5	4.4	8.4	17.1	5.2	4.4
Latvia	10.5	16.7	6.4	10.9	31.1	22.7	23.4
Lithuania	13.1	19.2	9.4	9.4	25.1	29.2	22.9
Luxembourg	10.6	16.8	5.3	9.7	18.1	12.7	11.4
Malta	6.9	24.7	7.1	12.0	20.4	8.1	3.4
Netherlands	8.0	19.1	4.5	7.5	20.7	8.4	4.3
Norway	m	11.4	m	8.0	m	6.6	2.4
Poland	12.7	18.4	7.5	11.3	13.6	12.0	9.6
Portugal	5.9	13.0	4.0	m	m	13.3	8.1
Romania	12.1	27.3	8.0	12.1	21.1	11.3	15.9
Slovakia	12.1	21.1	8.0	13.4	13.6	10.5	13.2
Slovenia	8.5	23.1	7.8	9.8	17.6	8.4	8.9
Spain	6.9	16.8	5.4	m	m	m	5.1
Sweden	5.9	13.2	4.4	7.1	14.0	4.5	1.9
Switzerland	8.4	19.1	4.5	7.1	25.2	m	m
United Kingdom	5.8	20.9	8.3	9.4	22.2	12.6	3.0

Source: HBSC 2013/2014.
Note: See data and methods section on definitions for each type of behaviours. – m = missing

Table A.2 – ***Prevalance of cumulative risks (regular smoking, drinking, binge drinking, regular fighting, frequent injuries, bullying others) as a % in the total sample***

Country	Not engaged in any risk behaviour	One or more	Two or more	Any three or more
Austria	55.3	44.7	20.5	9.22
Belgium	47.9	52.1	22.3	9.09
Bulgaria	45.6	54.4	26.8	13.03
Canada	58.9	41.1	15.5	5.72
Czech Republic	53.1	46.9	20.4	8.7
Denmark	50.4	49.6	22.8	10.21
Estonia	52.5	47.5	19.9	8.55
France	52.3	47.7	19.8	7.94
Germany	49.8	50.2	20.4	9.1
Greece	55.1	44.9	17.6	7.17
Hungary	55.3	44.7	20.4	9.47
Iceland	62.7	37.3	7.0	2.11
Ireland	69.7	30.3	9.6	4.01
Italy	57.0	43.0	17.1	6.83
Latvia	45.3	54.7	25.0	10.75
Lithuania	47.0	53.1	24.4	11.6
Luxembourg	59.4	40.6	16.9	7.07
Malta	56.0	44.0	18.0	6.92
Netherlands	60.3	39.7	14.8	5.81
Poland	60.5	39.6	18.1	8.47
Portugal	64.1	35.9	12.6	4.82
Romania	48.8	51.2	24.2	11.39
Slovakia	55.5	44.5	19.8	8.79
Slovenia	55.2	44.8	17.7	8.24
Sweden	71.4	28.6	10.3	4.16
United Kingdom	57.9	42.1	16.2	6.58
pooled sample	**56.1**	**43.9**	**17.7**	**7.6**

Source: HBSC 2013/2014

Table A.3 – ***Prevalance of cumulative risks (excluding frequent injuries) as a % in the total sample***

Country	Not engaged in any risk behaviour	One or more	Two or more	Any three or more
Austria	62.91	37.08	16.22	6.70
Belgium	61.27	38.73	14.87	5.94
Bulgaria	52.10	47.89	22.05	10.16
Canada	71.97	28.03	10.21	3.45
Croatia	66.36	33.64	16.08	7.81
Czech Republic	60.37	39.63	15.45	6.26
Denmark	63.69	36.31	17.22	6.73
Estonia	67.22	32.78	14.28	6.22
Finland	67.25	32.76	17.13	9.00
France	64.91	35.09	13.24	4.79
Germany	67.37	32.62	13.36	5.93
Greece	62.95	37.05	14.00	5.43
Hungary	61.20	38.80	16.67	7.77
Iceland	87.80	12.21	3.11	1.29
Ireland	81.72	18.28	6.47	3.14
Israel	76.34	23.67	9.68	4.27
Italy	66.09	33.91	12.77	4.58
Latvia	60.52	39.48	16.13	7.07
Lithuania	58.72	41.28	17.70	8.79
Luxembourg	68.20	31.81	12.49	4.90
Malta	66.37	33.63	12.61	4.53
Netherlands	73.04	26.96	10.33	3.86
Poland	67.78	32.22	15.37	6.88
Portugal	75.74	24.26	8.86	3.21
Romania	57.79	42.20	18.84	7.91
Slovakia	61.22	38.78	16.15	7.17
Slovenia	64.84	35.15	13.92	6.12
Spain	72.63	27.37	9.48	3.47
Sweden	79.88	20.11	7.23	3.11
United Kingdom	70.76	29.23	11.01	4.32
pooled sample	**68.43**	**31.57**	**12.69**	**5.31**

Source: HBSC 2013/2014

Table A.4 – ***Proportion of children reported risk factors by self-reported psychosomatic health status***

Country	Being in the 'bottom' group	0	1	2	3+	Difference between groups in reporting 3+
Austria	0	59.1	23.4	9.6	7.8	
	1	37.8	28.0	18.4	15.9	8.0
Belgium	0	51.3	30.1	11.8	6.8	
	1	31.0	28.9	19.8	20.3	13.5
Bulgaria	0	49.6	27.0	13.1	10.3	
	1	27.7	29.8	16.5	26.0	15.8
Canada	0	63.2	24.7	8.2	3.9	
	1	37.9	29.8	17.8	14.5	10.6
Czech Republic	0	57.3	25.8	10.3	6.5	
	1	36.1	29.0	17.6	17.4	10.8
Denmark	0	53.5	26.9	11.6	8.0	
	1	35.1	27.1	18.0	19.8	11.8
Estonia	0	56.9	26.9	9.5	6.7	
	1	34.2	30.7	18.7	16.5	9.8
France	0	56.4	27.0	10.1	6.5	
	1	34.7	32.4	18.8	14.2	7.7
Germany	0	53.3	29.7	10.1	6.9	
	1	33.4	30.9	16.5	19.2	12.3
Greece	0	59.0	26.9	8.9	5.2	
	1	36.4	30.0	17.1	16.4	11.2
Hungary	0	59.3	23.9	10.0	6.8	
	1	39.5	26.3	14.0	20.2	13.4
Iceland	0	67.2	28.3	3.5	1.0	
	1	44.4	38.4	10.7	6.6	5.5
Ireland	0	73.3	20.0	4.3	2.4	
	1	52.9	24.8	11.3	11.0	8.6
Italy	0	60.8	24.5	9.3	5.4	
	1	41.2	31.8	14.1	12.8	7.5
Latvia	0	48.6	29.1	13.3	9.0	
	1	31.7	30.6	19.0	18.8	9.8
Lithuania	0	50.2	28.1	12.2	9.5	
	1	32.0	31.4	15.7	20.9	11.4
Luxembourg	0	63.5	23.1	8.3	5.0	
	1	40.6	26.6	16.7	16.1	11.1
Malta	0	60.8	25.4	9.4	4.4	
	1	37.6	28.1	17.7	16.7	12.3
Netherlands	0	64.3	23.8	7.8	4.2	
	1	44.2	29.3	14.0	12.5	8.3
Poland	0	66.1	19.9	7.9	6.2	
	1	39.3	27.1	16.1	17.4	11.3
Romania	0	51.8	27.0	11.8	9.3	
	1	34.5	28.3	17.3	19.9	10.6
Slovakia	0	59.5	23.9	9.7	6.9	
	1	36.8	28.8	17.0	17.5	10.5
Slovenia	0	59.2	26.4	8.2	6.2	
	1	36.5	30.6	14.9	18.1	11.9
Sweden	0	76.2	16.6	4.8	2.5	
	1	54.2	24.7	10.9	10.1	7.7
United Kingdom	0	62.4	25.2	7.9	4.6	
	1	37.7	29.8	17.0	15.5	10.9

Source: HBSC 2013/2014. '0'- children not in the bottom group, '1' – children in the bottom of health

Table A.5 – ***Likelihood of drinking and being drunk (binge drinking) associated with being in the bottom group in the psychosomatic health, consumption of sugar and life-satisfaction***

	Drinking							Drunkenness						
	Poor health OR	SE	Excess sugar OR	SE	Low life satisfaction OR	SE	Obs. N.	Poor health OR	SE	Excess sugar OR	SE	Low life satisf. OR	SE	Obs. N
Austria	1.54**	(0.202)	1.34*	(0.163)	1.50*	(0.246)	3,194	1.59*	(0.349)	1.42*	(0.231)	1.58*	(0.365)	3,217
Belgium	1.69***	(0.138)	1.25***	(0.083)	1.45***	(0.121)	8,978	2.02***	(0.184)	1.58***	(0.134)	1.80***	(0.224)	9,663
Bulgaria	2.13***	(0.202)	1.56***	(0.118)	1.11	(0.123)	4,399	2.43***	(0.319)	1.83***	(0.187)	1.35*	(0.176)	4,409
Canada	1.97***	(0.184)	1.20**	(0.082)	1.37***	(0.117)	11,542	2.40***	(0.273)	1.13	(0.107)	1.55**	(0.212)	11,621
Croatia	2.11***	(0.206)	1.59***	(0.140)	1.28*	(0.138)	4,787	2.62***	(0.359)	1.75***	(0.203)	1.53**	(0.220)	4,846
Czech Rep	1.59***	(0.143)	1.52***	(0.111)	1.27	(0.163)	4,871	2.01***	(0.249)	1.76***	(0.186)	1.38	(0.235)	4,877
Denmark	2.16***	(0.236)	1.20*	(0.105)	1.35	(0.236)	3,589	2.15***	(0.299)	1.28	(0.178)	1.12	(0.222)	3,591
Estonia	1.92***	(0.225)	1.33*	(0.161)	1.20	(0.154)	2,560	2.27***	(0.351)	1.86***	(0.273)	1.22	(0.218)	3,899
France	1.57***	(0.169)	1.21*	(0.113)	1.27*	(0.139)	5,298	1.72**	(0.339)	1.39*	(0.210)	1.52*	(0.273)	5,388
Germany	1.72***	(0.151)	1.35**	(0.123)	1.45***	(0.158)	5,531	1.66***	(0.235)	1.30*	(0.156)	1.78***	(0.258)	5,535
Greece	2.05***	(0.211)	2.09***	(0.213)	0.98	(0.115)	3,867	2.96***	(0.476)	1.79***	(0.264)	0.98	(0.197)	3,894
Hungary	1.86***	(0.204)	1.48***	(0.141)	1.22	(0.138)	3,587	2.63***	(0.348)	1.80***	(0.210)	1.09	(0.180)	3,610
Iceland	2.42***	(0.311)	1.79***	(0.194)	2.46***	(0.330)	9,523	3.24***	(0.646)	2.46***	(0.413)	2.96***	(0.630)	9,592
Ireland	2.07***	(0.295)	1.69***	(0.217)	1.46**	(0.208)	3,677	2.89***	(0.594)	1.76***	(0.252)	1.53*	(0.306)	3,719
Italy	2.01***	(0.215)	1.49***	(0.145)	1.01	(0.121)	3,883	2.22***	(0.429)	1.32	(0.215)	1.19	(0.221)	3,898
Latvia	1.72***	(0.177)	2.04***	(0.186)	1.48**	(0.181)	5,210	1.79***	(0.240)	1.78***	(0.221)	1.56*	(0.263)	5,212
Lithuania	2.09***	(0.204)	1.83***	(0.160)	1.22	(0.148)	5,374	2.20***	(0.255)	1.62***	(0.181)	1.51*	(0.248)	5,426
Luxembourg	1.96***	(0.206)	1.46**	(0.175)	1.32*	(0.162)	2,836	1.81***	(0.287)	1.56*	(0.341)	2.78***	(0.585)	2,877
Malta	1.71**	(0.306)	0.94	(0.148)	1.77**	(0.298)	2,034	2.60***	(0.544)	0.95	(0.224)	1.59	(0.389)	2,054
Netherlands	1.96***	(0.223)	1.33*	(0.150)	1.32*	(0.178)	3,950	2.36***	(0.455)	1.44*	(0.248)	1.10	(0.200)	3,983
Poland	2.25***	(0.235)	1.77***	(0.171)	1.38**	(0.152)	4,191	2.14***	(0.328)	2.37***	(0.297)	1.67***	(0.229)	4,208
Portugal	1.94***	(0.239)	1.95***	(0.169)	1.41**	(0.135)	4,767	1.96***	(0.273)	2.11***	(0.259)	1.73**	(0.285)	4,767
Romania	1.81***	(0.202)	1.29*	(0.129)	1.20	(0.138)	3,501	2.17***	(0.384)	2.18***	(0.286)	1.42*	(0.226)	3,499
Slovakia	1.63***	(0.150)	1.73***	(0.150)	1.24*	(0.107)	5,585	1.88***	(0.221)	2.08***	(0.223)	1.41**	(0.183)	5,587
Slovenia	2.05***	(0.200)	1.81***	(0.162)	1.34*	(0.167)	4,786	2.03***	(0.277)	1.68***	(0.215)	1.82***	(0.303)	4,795
Spain	1.74***	(0.150)	1.70***	(0.110)	1.14	(0.105)	9,114	1.92***	(0.253)	1.50***	(0.165)	1.24	(0.159)	9,205
Sweden	2.13***	(0.182)	2.58***	(0.246)	1.28**	(0.121)	7,119	1.79***	(0.247)	2.78***	(0.388)	1.64***	(0.238)	7,131
Switzerland	1.56***	(0.143)	1.33***	(0.108)	1.30*	(0.145)	6,167	1.72***	(0.278)	1.91***	(0.277)	1.41	(0.260)	6,198
UK	1.97***	(0.117)	1.76***	(0.102)	1.26**	(0.094)	14,816	2.14***	(0.193)	1.98***	(0.162)	1.32*	(0.149)	14,888

Source: HSBC 2013/2014; Note: *** p<0.001, ** p<0.01, * p<0.05. All models are controlled for age, gender and family affluence scale (RiditFAS).

Table A.6 – ***Likelihood of regular fighting and frequent injuries associated with being in the bottom group for psychosomatic health, consumption of sugar and life satisfaction***

	Regular fighting							Frequent injuries						
	Poor health OR	SE	Excess sugar OR	SE	Low life satisfaction OR	SE	Obs. N.	Poor health OR	SE	Excess sugar OR	SE	Low life satisf. OR	SE	Obs. N
Austria	3.00***	(0.427)	1.54***	(0.179)	1.57*	(0.300)	3,235	1.82***	(0.221)	1.39***	(0.134)	1.28	(0.209)	3,222
Belgium	2.71***	(0.217)	1.64***	(0.118)	1.69***	(0.172)	9,632	2.33***	(0.144)	1.19**	(0.066)	1.36***	(0.094)	9,684
Bulgaria	1.87***	(0.224)	1.67***	(0.149)	1.23	(0.174)	4,415	2.26***	(0.216)	1.13	(0.101)	0.99	(0.128)	4,427
Canada	2.79***	(0.263)	1.18	(0.143)	1.93***	(0.223)	11,767	2.69***	(0.235)	1.06	(0.083)	1.03	(0.091)	11,834
Croatia	2.50***	(0.321)	1.63***	(0.193)	1.53**	(0.216)	4,697	2.82***	(0.241)	1.47***	(0.119)	1.27*	(0.132)	4,814
Czech Rep	2.54***	(0.293)	1.27*	(0.146)	1.72***	(0.246)	4,913	2.39***	(0.214)	1.04	(0.085)	1.14	(0.155)	4,925
Denmark	2.55***	(0.361)	1.52**	(0.213)	2.24***	(0.405)	3,562	2.16***	(0.189)	1.09	(0.083)	1.30*	(0.142)	3,558
Estonia	2.11***	(0.359)	2.16***	(0.317)	1.79**	(0.346)	3,939	2.11***	(0.192)	1.21*	(0.094)	1.18	(0.121)	3,931
Finland	2.91***	(0.419)	1.63***	(0.217)	2.65***	(0.422)	5,725	2.47***	(0.213)	1.28***	(0.094)	1.33*	(0.153)	5,741
France	2.14***	(0.268)	1.99***	(0.204)	1.29*	(0.161)	5,379	2.38***	(0.202)	1.14	(0.083)	1.25*	(0.110)	5,396
Germany	2.94***	(0.338)	1.47***	(0.140)	1.31*	(0.172)	5,585	1.99***	(0.153)	1.07	(0.070)	1.20*	(0.102)	5,173
Greece	3.21***	(0.483)	1.15	(0.160)	1.57**	(0.247)	3,922	2.02***	(0.242)	1.17	(0.132)	1.06	(0.142)	3,928
Hungary	2.13***	(0.251)	1.75***	(0.182)	1.26	(0.179)	3,610	1.95***	(0.228)	1.39**	(0.155)	1.33*	(0.183)	3,549
Iceland	3.04***	(0.292)	1.73***	(0.138)	2.15***	(0.245)	9,525	2.14***	(0.140)	1.05	(0.056)	1.18**	(0.074)	9,615
Ireland	2.41***	(0.377)	1.37*	(0.192)	1.58*	(0.281)	3,732	2.02***	(0.252)	1.35**	(0.131)	1.16	(0.140)	3,748
Italy	2.36***	(0.356)	1.43**	(0.171)	1.51*	(0.283)	3,880	2.13***	(0.224)	1.31**	(0.115)	0.98	(0.123)	3,896
Latvia	2.34***	(0.278)	1.68***	(0.172)	1.65***	(0.216)	5,285	1.76***	(0.145)	1.21*	(0.093)	1.06	(0.084)	5,300
Lithuania	1.63***	(0.219)	2.06***	(0.233)	1.60**	(0.246)	5,393	1.62***	(0.126)	1.28**	(0.094)	1.25*	(0.118)	5,442
Luxembourg	2.66***	(0.425)	1.42*	(0.220)	2.02***	(0.357)	2,805	2.47***	(0.300)	1.13	(0.118)	1.32*	(0.171)	2,859
Malta	2.42***	(0.365)	1.05	(0.210)	2.03***	(0.377)	2,062	2.34***	(0.377)	0.79	(0.126)	1.17	(0.232)	2,060
Netherlands	1.66**	(0.291)	1.36*	(0.183)	1.63**	(0.262)	3,907	1.95***	(0.180)	1.06	(0.100)	1.62***	(0.176)	3,931
Norway	3.31***	(0.586)	1.35	(0.233)	1.39	(0.297)	2,688	2.04***	(0.251)	1.03	(0.110)	1.20	(0.162)	2,684
Poland	2.04***	(0.268)	1.95***	(0.250)	1.46**	(0.178)	4,202	2.92***	(0.280)	1.09	(0.125)	1.06	(0.132)	4,174
Romania	2.50***	(0.326)	2.09***	(0.245)	1.93***	(0.304)	3,574	1.78***	(0.177)	1.37***	(0.124)	1.62***	(0.202)	3,584
Slovakia	2.27***	(0.242)	1.56***	(0.151)	1.30**	(0.131)	5,625	2.59***	(0.229)	1.05	(0.094)	1.07	(0.107)	5,630
Slovenia	2.53***	(0.325)	1.82***	(0.215)	1.63**	(0.255)	4,813	2.31***	(0.231)	1.41***	(0.123)	1.24	(0.149)	4,810
Sweden	2.67***	(0.310)	2.40***	(0.296)	1.76***	(0.218)	7,111	2.21***	(0.176)	1.21*	(0.117)	1.31**	(0.125)	7,078
Switzerland	2.53***	(0.314)	1.53***	(0.176)	1.90***	(0.292)	6,192	2.44***	(0.175)	1.18*	(0.080)	1.29**	(0.119)	6,214
UK	2.65***	(0.190)	1.85***	(0.119)	1.58***	(0.158)	14,756	2.19***	(0.128)	1.23***	(0.056)	1.04	(0.068)	14,945

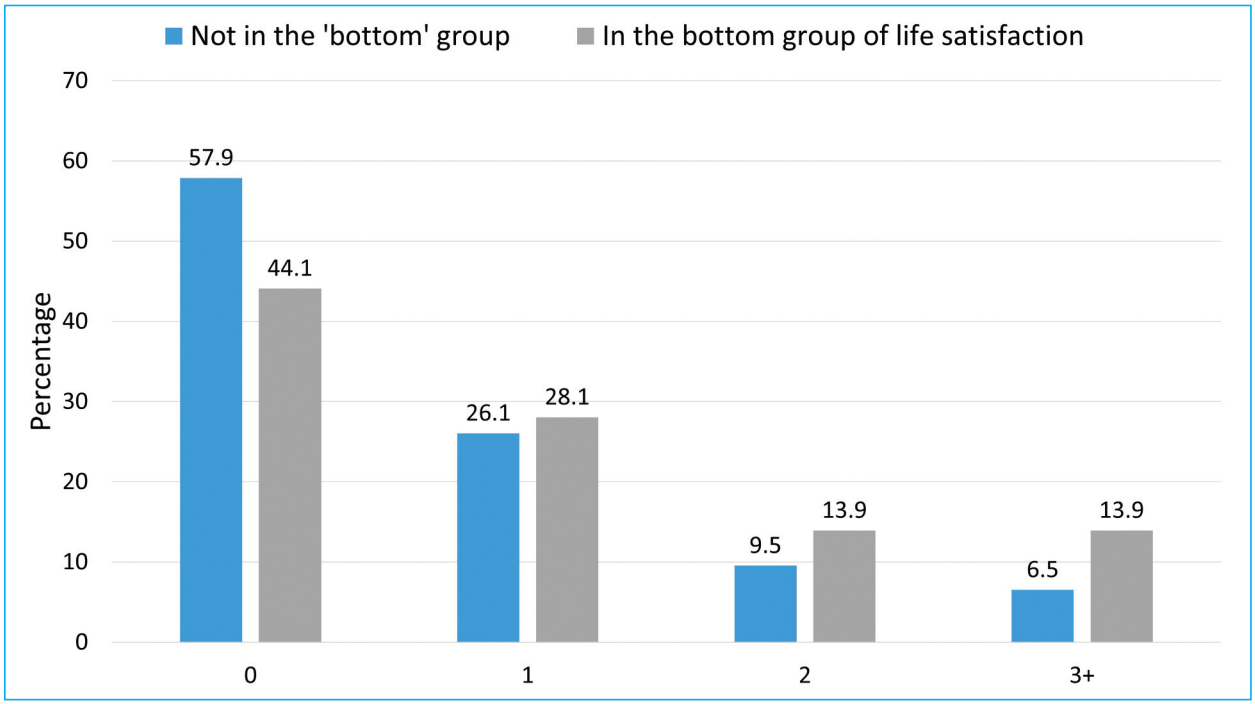
Source: HBSC 2013/2014. Note: *** p<0.001, ** p<0.01, * p<0.05. All models are controlled for age groups, gender and family affluence scale (Ridit FAS).

Table A.7 – ***Likelihood of being bullied associated with being in the bottom group in psychosomatic health, sugar consumption and life satisfaction***

	Poor health		Excess sugar		Low life satisfaction		Girls		Age 13 (ref. 11)		Age 15 (ref.11)		Ridit FAS		Constant		Observations
	Odds ratio	SE	Odds ratio	SE	Odds ratio	SE	Odds ratio	SE	Odds ratio	SE	Odds ratio	SE	Odds ratio	SE	Odds ratio	SE	N.
Austria	2.50***	(0.349)	1.11	(0.125)	1.92***	(0.280)	0.56***	(0.062)	1.16	(0.169)	0.51***	(0.080)	0.51***	(0.102)	0.27***	(0.041)	3,234
Belgium	2.77***	(0.206)	1.34***	(0.086)	1.71***	(0.187)	0.60***	(0.040)	0.84	(0.094)	0.52***	(0.063)	0.76*	(0.094)	0.22***	(0.023)	9,695
Bulgaria	2.78***	(0.281)	1.03	(0.104)	1.85***	(0.203)	0.71***	(0.070)	0.74**	(0.084)	0.46***	(0.061)	0.87	(0.153)	0.21***	(0.031)	4,396
Canada	3.39***	(0.351)	1.16	(0.095)	2.64***	(0.275)	0.87	(0.074)	0.86	(0.102)	0.45***	(0.052)	0.83	(0.108)	0.14***	(0.017)	11,889
Czech	3.46***	(0.484)	0.74	(0.118)	2.30***	(0.378)	0.69**	(0.096)	0.88	(0.134)	0.56***	(0.095)	0.56*	(0.128)	0.08***	(0.013)	4,887
Denmark	2.49***	(0.355)	1.28	(0.165)	3.54***	(0.639)	0.74	(0.123)	0.56**	(0.095)	0.36***	(0.070)	0.43***	(0.103)	0.10***	(0.023)	3,572
Estonia	3.35***	(0.429)	0.96	(0.111)	2.31***	(0.281)	0.58***	(0.053)	0.55***	(0.061)	0.21***	(0.031)	0.76	(0.118)	0.34***	(0.042)	3,928
Finland	2.72***	(0.291)	0.86	(0.097)	2.30***	(0.288)	0.68***	(0.068)	0.80	(0.098)	0.54***	(0.067)	0.85	(0.136)	0.14***	(0.017)	5,719
France	2.96***	(0.337)	0.92	(0.100)	2.20***	(0.253)	0.62***	(0.059)	0.93	(0.101)	0.69**	(0.094)	0.88	(0.130)	0.13***	(0.017)	5,289
Germany	2.94***	(0.330)	1.02	(0.117)	2.55***	(0.258)	0.80*	(0.076)	0.96	(0.107)	0.54***	(0.076)	0.64*	(0.121)	0.11***	(0.015)	5,601
Greece	2.53***	(0.351)	0.98	(0.154)	2.07***	(0.340)	0.82	(0.111)	1.08	(0.200)	0.87	(0.164)	0.73	(0.174)	0.06***	(0.012)	3,862
Hungary	3.25***	(0.423)	0.58***	(0.081)	1.59**	(0.239)	0.78*	(0.089)	0.77	(0.104)	0.35***	(0.059)	0.92	(0.199)	0.13***	(0.021)	3,600
Iceland	3.56***	(0.456)	1.23	(0.164)	3.95***	(0.534)	0.76*	(0.086)	0.65***	(0.076)	0.12***	(0.024)	0.89	(0.182)	0.05***	(0.007)	9,491
Ireland	3.12***	(0.492)	1.03	(0.135)	2.84***	(0.449)	0.78	(0.114)	0.58**	(0.100)	0.43***	(0.073)	0.63*	(0.144)	0.11***	(0.020)	3,717
Italy	3.34***	(0.539)	1.17	(0.199)	2.23***	(0.374)	0.54***	(0.083)	0.62**	(0.113)	0.28***	(0.063)	0.67	(0.175)	0.08***	(0.018)	3,878
Latvia	2.23***	(0.188)	1.07	(0.088)	1.96***	(0.180)	0.76***	(0.061)	0.88	(0.081)	0.54***	(0.063)	0.85	(0.118)	0.33***	(0.033)	5,291
Lithuania	2.12***	(0.159)	1.00	(0.079)	2.21***	(0.216)	0.63***	(0.048)	0.87	(0.068)	0.62***	(0.048)	0.54***	(0.065)	0.64***	(0.058)	5,453
Luxembourg	2.77***	(0.511)	1.50**	(0.196)	2.34***	(0.329)	0.83	(0.101)	0.54***	(0.083)	0.45***	(0.081)	0.53**	(0.126)	0.20***	(0.035)	2,831
Malta	2.55***	(0.589)	0.79	(0.177)	3.61***	(0.466)	0.44***	(0.095)	0.96	(0.196)	0.35**	(0.109)	1.35	(0.401)	0.09***	(0.017)	2,059
Netherlands	2.37***	(0.351)	0.86	(0.126)	3.60***	(0.532)	0.79	(0.109)	0.64**	(0.102)	0.38***	(0.066)	0.53**	(0.119)	0.12***	(0.022)	3,944
Norway	4.75***	(0.795)	1.24	(0.224)	2.90***	(0.510)	0.66*	(0.116)	0.60*	(0.122)	0.33***	(0.074)	0.54*	(0.162)	0.09***	(0.018)	2,728
Poland	3.35***	(0.377)	1.03	(0.124)	2.03***	(0.256)	0.51***	(0.054)	0.72**	(0.088)	0.44***	(0.060)	1.00	(0.165)	0.16***	(0.020)	4,218
Portugal	3.03***	(0.406)	1.39**	(0.148)	1.95***	(0.179)	0.61***	(0.054)	0.88	(0.105)	0.48***	(0.061)	1.18	(0.190)	0.14***	(0.021)	4,516
Romania	2.66***	(0.345)	0.81	(0.125)	1.99***	(0.295)	0.49***	(0.062)	1.17	(0.162)	0.52***	(0.081)	1.38	(0.298)	0.13***	(0.021)	3,559
Slovakia	2.62***	(0.297)	0.93	(0.104)	2.07***	(0.226)	0.58***	(0.055)	0.68**	(0.079)	0.58***	(0.074)	0.74	(0.131)	0.15***	(0.021)	5,633
Slovenia	3.66***	(0.516)	1.16	(0.157)	2.50***	(0.352)	0.49***	(0.065)	0.73**	(0.087)	0.42***	(0.064)	0.63*	(0.125)	0.13***	(0.020)	4,742
Sweden	3.12***	(0.431)	1.39	(0.240)	3.59***	(0.537)	1.03	(0.135)	0.57***	(0.091)	0.30***	(0.054)	0.57*	(0.132)	0.04***	(0.007)	7,147
UK	3.00***	(0.212)	1.08	(0.070)	2.35***	(0.195)	0.84**	(0.056)	0.88	(0.059)	0.48***	(0.043)	0.76**	(0.078)	0.14***	(0.011)	14,754

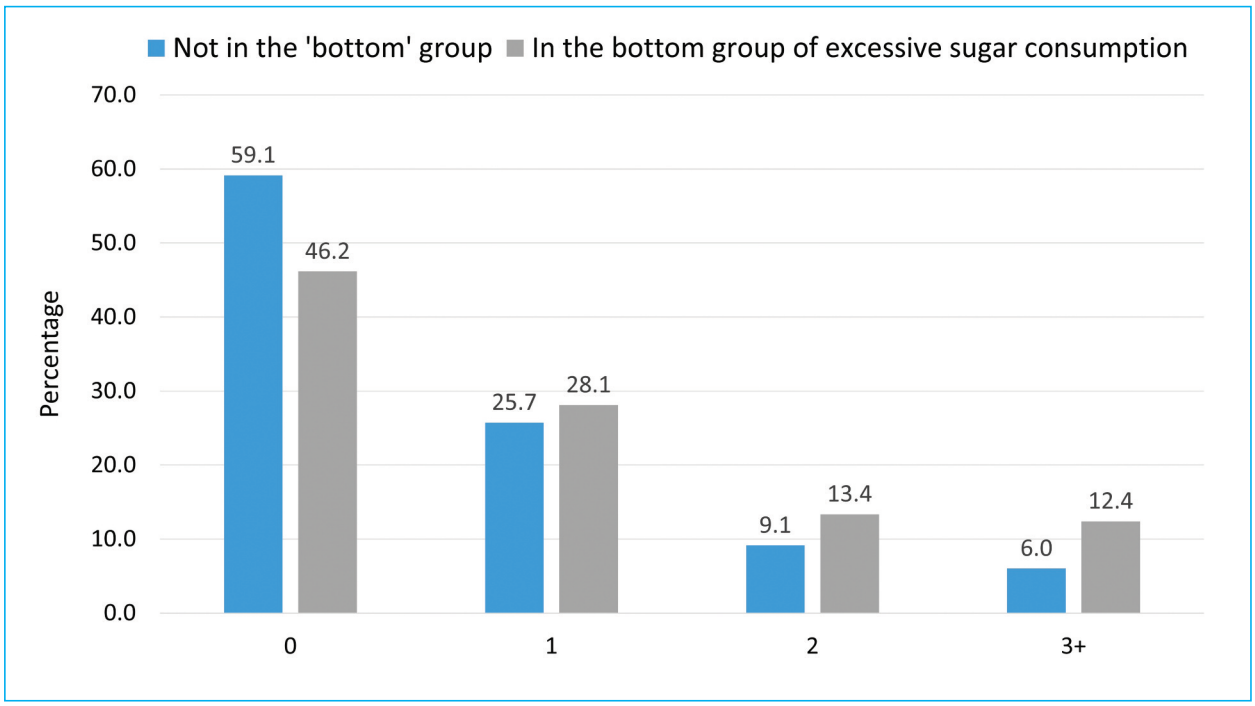
Source: HBSC 2013/2014; Note: *** p<0.001, ** p<0.01, * p<0.05

Figure A.1 – ***Prevalence of individual and cumulative risks by disadvantage in life satisfaction in a pooled sample of countries***



Source: HSBC 2013/2014

Figure A.2 – ***Prevalence of individual and cumulative risks by unhealthy eating in a pooled sample of countries***



Source: HBSC 2013/2014